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Job No.: CECTC-BBMP-KRIDL-W.No.14-2015-16 18.04.2015

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS MACADAM MIX
AASHTO T 164 & AASHTO T 30

CLIENT	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, PIU, Bangalore.
NAME OF WORK	Improvements to Bagalagunte Main Road (from Maramma Temple to MEI Main Road) connecting MEI Layout Main Road & Cross Roads in Ward No. 14, BBMP, Bangalore.
REFERENCE	EE/DD/WO/372/2014-15 Dated: 31.03.2015
DATE OF TESTING	18.04.2015

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	483	484
3. Weight of Asphalt and Mineral matter	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	17	16.00
7. Bitumen content in %	3.40	3.20
8. Average	**3.30**	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Trail 1				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
26.5	0	0	0	100	100
19	36.52	7.56	7.56	92.44	90-100
13.2	164.3	34.02	41.58	58.42	56-88
4.75	150.8	31.22	72.80	27.20	16-36
2.36	55.4	11.47	84.27	15.73	4-19
0.3	38.9	8.05	92.32	7.68	2-10
0.075	5.2	1.08	93.40	6.60	0-8

SIEVE SIZE	Trail 2				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
26.5	0	0	0	100	100
19	31.25	6.25	6.25	93.75	90-100
13.2	159.8	31.96	38.21	61.79	56-88
4.75	174.3	34.86	73.07	26.93	16-36
2.36	62.4	12.48	85.55	14.45	4-19
0.3	32.9	6.58	92.13	7.87	2-10
0.075	10.5	2.10	94.23	5.77	0-8

Note:

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Job No.: CECTC-BBMP-KRIDL-W.No.14-2015-16 20.04.2015

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

CLIENT	:	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
AGENCY	:	**Technical Manager (West),** KRIDL, PIU, Bangalore.
NAME OF WORK	:	Improvements to Bagalagunte Main Road (from Maramma Temple to MEI Main Road) connecting MEI Layout Main Road & Cross Roads in Ward No. 14, BBMP, Bangalore.
REFERENCE	:	EE/DD/WO/372/2014-15 Dated: 31.03.2015
SAMPLE ID	:	Bitumen (Bituminous Concrete)
DATE OF TESTING	:	20.04.2015

The results of the tests conducted on the Bitumen sample for Bituminous Concrete

Sl.No	Description	Test Method as per IS	Test Result	Requirement as per IS: 73-2013
1	Penetration at 25^{0}C, 100g, 5 Sec 1/10 mm	IS: 1203-1978 (RA-2009)	87	80 to 100
2	Softening point, ^{0}C	IS: 1205-1978 (RA-2009)	48	Min. 40
3	Ductility at 27^{0}C, cm	IS: 1208-1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS: 1209-1978 (RA-2009)	278	Min. 220

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Job No.: CECTC-BBMP-KRIDL-W.No.14-2015-16 20.04.2015

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, PIU, Bangalore.
Name of the Work	Improvements to Bagalagunte Main Road (from Maramma Temple to MEI Main Road) connecting MEI Layout Main Road & Cross Roads in Ward No. 14, BBMP, Bangalore.
Reference	EE/DD/WO/372/2014-15 Dated: 31.03.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	20.04.2015

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	377	383	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	78	84	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	299	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	20.69	21.93	**21.31**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: CECTC-BBMP-KRIDL-W.No.14-2015-16 21.04.2015

Specific Gravity And Water Absorption Test
IS: 2386 Part III

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, PIU, Bangalore.
Name of the Work	Improvements to Bagalagunte Main Road (from Maramma Temple to MEI Main Road) connecting MEI Layout Main Road & Cross Roads in Ward No. 14, BBMP, Bangalore.
Reference	EE/DD/WO/372/2014-15 Dated: 31.03.2015
Type of Mix	Bituminous Concrete
Date of Testing	21.04.2015

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2058	1969	1998	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1303	1214	1243	
4	Weight of saturated surface dry aggregate in air	W_3 g	2033	2009	2008	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	730	795	765	
6	Weight of oven dried aggregate	W_4 g	2016	1995	1993	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.762	2.509	2.605	2.625
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.827	2.554	2.657	2.680
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.84%	0.70%	0.75%	0.77%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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Job No.: CECTC-BBMP-KRIDL-W.No.14-2015-16 20.04.2015

TEST REPORT ON STABILITY OF MIX

Client	:	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	:	**Technical Manager (West),** KRIDL, PIU, Bangalore.
Name of the Work	:	Improvements to Bagalagunte Main Road (from Maramma Temple to MEI Main Road) connecting MEI Layout Main Road & Cross Roads in Ward No. 14, BBMP, Bangalore.
Reference	:	EE/DD/WO/372/2014-15 Dated: 31.03.2015
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	21.04.2015

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	10.55	9.60	9 Kn (min)
2	Marshal flow, mm	2.30	3.45	2 – 4
3	Percent air voids in Mineral Aggregate	14.25	13.50	13 – 15
4	Voids in Compacted Mix	5.10	4.75	3 – 6
5	Percent Voids filled with Bitumen	68.85	69470	65 - 75
6	Density, g/cc	2.26	2.27	--

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